

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		ATTORNEY'S DOCKET NUMBER 217958US3PCT
INTERNATIONAL APPLICATION NO. PCT/JP00/04980	INTERNATIONAL FILING DATE 26 JULY 2000	U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 10/030939
PRIORITY DATE CLAIMED 28 JULY 1999		
TITLE OF INVENTION GAS GENERATOR		
APPLICANT(S) FOR DO/EO/US Akihiko SUEHIRO, et al.		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
<ol style="list-style-type: none"> <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31). <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c) (2)) <ol style="list-style-type: none"> <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau). <input checked="" type="checkbox"/> has been communicated by the International Bureau. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). <ol style="list-style-type: none"> <input checked="" type="checkbox"/> is attached hereto. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4). <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3)) <ol style="list-style-type: none"> <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). <input type="checkbox"/> have been communicated by the International Bureau. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. <input checked="" type="checkbox"/> have not been made and will not be made. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)). <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)). <input type="checkbox"/> A copy of the International Preliminary Examination Report (PCT/IPEA/409). <input checked="" type="checkbox"/> A copy of the International Search Report (PCT/ISA/210). 		
Items 13 to 20 below concern document(s) or information included:		
<ol style="list-style-type: none"> <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. <input type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. <input type="checkbox"/> A substitute specification. <input type="checkbox"/> A change of power of attorney and/or address letter. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4). <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4). <input type="checkbox"/> Certificate of Mailing by Express Mail <input checked="" type="checkbox"/> Other items or information: 		
Notice of Priority / PCT/IB/304 / PCT/IB/308 PTO-1449 / Drawing (1 sheet)		

U.S. APPLICATION NO. (IF KNOWN SEE 37 CFR 107030939	INTERNATIONAL APPLICATION NO. PCT/JP00/04980	ATTORNEY'S DOCKET NUMBER 217958US3PCT
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24. The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

- | | |
|--|-----------|
| <input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO | \$1040.00 |
| <input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO | \$890.00 |
| <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO | \$740.00 |
| <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) | \$710.00 |
| <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) | \$100.00 |

CALCULATIONS PTO USE ONLY

ENTER APPROPRIATE BASIC FEE AMOUNT =

\$890.00

Surcharge of \$130.00 for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (e)).

20 30

\$0.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	7 - 20 =	0	x \$18.00	\$0.00
Independent claims	1 - 3 =	0	x \$84.00	\$0.00

Multiple Dependent Claims (check if applicable). **\$0.00**

TOTAL OF ABOVE CALCULATIONS =

\$890.00

Applicant claims small entity status. See 37 CFR 1.27). The fees indicated above are reduced by 1/2. **\$0.00**

SUBTOTAL =

\$890.00

Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)). 20 30 + **\$0.00**

TOTAL NATIONAL FEE =

\$890.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). **\$0.00**

TOTAL FEES ENCLOSED =

\$890.00

	Amount to be: refunded	\$
	charged	\$

- a. A check in the amount of **\$890.00** to cover the above fees is enclosed.
- b. Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **15-0030** A duplicate copy of this sheet is enclosed.
- d. Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:



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C. Irvin McClelland

NAME

21,124

REGISTRATION NUMBER

Jan 15 2002

DATE

1/Pvt>

Specification

GAS GENERATOR

5 Technical Field

The present invention relates to a gas generator for use in an airbag safety system for safely protecting a driver and occupant from an impact caused by a collision of an automobile or the like.

10 Background Art

The gas generators of this type include the one having a housing made of an aluminum alloy, iron, or steel. Because a housing made of an aluminum alloy is readily molded compared to a housing made of iron or steel, in some housings, an ignitor holding portion for fixing an ignitor is integrally formed at a center of a lower lid, as disclosed in Japanese Unexamined Patent Publication No. Hei 10-081190. In some housings made of iron or steel, for example, an ignitor holding portion (a holder for an ignitor), that is another member, is fixed by welding on a press-formed lower lid, as disclosed in Japanese Unexamined Patent Publication No. Hei 11-078764.

In consideration of environment and safety, there is a tendency to change an azidation gas generating agent in which

sodium azide is used to a nitrogen containing organic-compound gas generating agent.

However, a combustion temperature of the nitrogen containing organic-compound gas generating agent is likely to be 5 high compared to that of the azidation gas generating agent. A higher pressure is required to keep the same level of burning characteristic and a housing made of an aluminum alloy and having a construction of a single cylinder has a limit in heat resistance and pressure resistance.

10 A housing should have a sealing construction to protect a gas generating agent from deterioration by moisture absorption. If an ignitor holding member is fixed by welding on the housing made of iron or steel, in addition to a welding process, there is a possibility that a problem occurs with regard to reliability in sealing of a 15 welded portion. Therefore, from necessity to keep the reliability, a leak test should be carried out beforehand.

Similarly, in a case that the ignitor holding member is fixed by caulking, it is necessary to add a sealing member such as a packing, to fix by caulking, and to carry out a seal test.

20 In a case that a length in an axial direction (L) is shorter than a diameter (D) of a gas generator ($L/D \leq 1$), a lower lid cannot be so thick as to prevent a modification by a high internal pressure generated at the time of burning of a gas generating agent. If the

lower lid is modified by a pressure generated at the time of burning of the gas generating agent, there may occur a leak of a combustion gas with a damage of a welded portion of an ignitor holding portion and unfixing of a caulking. There is an adverse possibility that
5 the leaked combustion gas does not go through a cooling/filtering member.

It is an object of the present invention to solve various problems described above, specifically, to provide a gas generator suitable for a nitrogen containing organic-compound gas generating
10 agent and excellent in heat resistance, pressure resistance, and sealing.

Disclosure of the Invention

A gas generator of the present invention is so structured
15 that a housing is formed by joining an iron- or steel-made upper lid, containing a top plate and a side cylinder extending downward from an entire circumferential edge thereof and provided with many gas discharge holes with an iron- or steel-made lower lid, containing a bottom plate, side cylinder extending upward from an entire
20 circumferential edge thereof, and an ignitor holding portion formed integrally with the bottom plate and for fixing by caulking an ignitor. In the housing, the ignitor and a gas generating agent are arranged in the order mentioned from a center thereof. A flange

extending horizontally outward from the side cylinder of the top plate is formed. The integral forming is done by a repetition of pressuring iron or steel to flow. The lower lid is formed into a ball-like shape. The ignitor holding portion comprises an inner 5 side cylindrical portion standing on a wall thickness portion of the bottom plate of the ball-like lower lid and holding the ignitor, a protruding portion protruding into a center from the inner side cylindrical portion and mounting the ignitor, and a bending portion extending from the inner side cylindrical portion, bending towards 10 the center, and fixing the ignitor by caulking. Organic-compound gas generating agents containing mainly nitrogen are disposed in the housing.

Hence, the ignitor holding portion is formed integrally with the bottom plate in the gas generator of the present invention, a 15 sealing test of the ignitor holding portion is not necessary. It is possible to protect the gas generating agent from deterioration by moisture absorption caused by a defective seal. Because the lower lid is made of high strength iron or steel, it is also possible to prevent the lower lid from being modified by a high internal 20 pressure generated at the time of burning of a nitrogen containing organic-compound. The lower lid and the ignitor holding portion are formed integrally. As a result, it is possible to prevent a sealing portion from being damaged even if the lower lid is modified

by the internal pressure.

Because the flange is formed on the upper lid side, the ignitor holding portion can be formed integrally on the lower lid side.

5 By a repetition of pressuring iron or steel to flow by partial forging, spinning or the like, it is possible to form the ignitor holding portion integrally with the lower lid even if the lower lid is made of iron or steel. Also, the lower lid is formed into a ball-like shape. As a result, a high mechanical strength can be shown. As
10 a result, it is also possible to prevent the lower lid from being modified by a high internal pressure generated at the time of burning of a nitrogen containing organic-compound.

The ignitor holding portion is formed by a repetition of pressuring iron or steel to flow, it is possible that the ignitor
15 holding portion is formed integrally from the bottom plate into an interior of the housing in a standing shape. Therefore, a sealing of the ignitor holding portion is not necessary to be tested. As integrally formed, the ignitor holding portion can keep a high strength and prevent a seal from being damaged even if the lower
20 lid is modified by the internal pressure generated at the time of burning of organic-compound gas generating agents.

As mounted on the lower lid over a wall thickness portion, the ignitor holding portion can keep a higher strength and prevent

a seal from being damaged more reliably.

Because the ignitor holding portion is integrally formed, a wall thickness of the lower lid can be thickened even if L/D is no more than 1.

5

Brief Description of the Drawings

FIG. 1 is a schematic sectional view showing an entire structure of an example of a gas generator according to the present invention.

10

Best Mode for Carrying Out the Invention

The embodiments of a gas generator according to the present invention will be described below with reference to the drawing.

FIG. 1 is a schematic sectional view showing an example of the gas generator G1 of the present invention. As shown in FIG. 1, a gas generator G1 is composed of an iron- or steel made upper and lower lids 2 and 3.

15

Iron or steel to be used may be wrought iron, iron, steel, steel alloy, and the like generally used in forging, spinning, and press-forming and the like and is not specifically limited.

20

The upper lid 2 is composed of a top plate 2a, a side cylinder 1a extending downward from the entire circumferential edge thereof and provided with many gas discharge holes 8, and a flange

1c extending vertically outward from the side cylinder 1a and mounting an airbag module (not shown).

The lower lid 3 is composed of a bottom plate 3f, a side cylinder 1b extending upward from the entire circumferential edge 5 thereof, and an ignitor holding portion 3a formed integrally with the bottom plate 3f and for fixing by caulking an ignitor 30.

The upper lid 2 and the lower lid 3 are formed by a repetition of partial pressuring to flow. In this case, the repetition of partial pressuring to flow means to partially repeat general forging and 10 spinning processes. Therefore, the upper lid 2 and the lower lid 3 are made of a single plate-like iron or steel or a single block-like iron or steel by using a metal pattern for example, and combining methods of forging, spinning, pressing processes and the like.

By the partially repetition of pressuring to flow as described above, it is possible to form the top plate 2a and the bottom plate 3f of the upper lid 2 and the lower lid 3 into a ball-like shape, wherein the lower lid has enough pressure resistance not to be modified by the internal pressure generated at the time of burning of a nitrogen containing organic-compound.

Because a flange 1c is formed with the upper lid 2 for mounting an airbag module, it is not required to excessively complicate a form of the lower lid 3 integrally formed with the ignitor holding portion 3a. As a result, the ignitor holding portion

3a can be formed integrally.

It is preferable that the ignitor holding portion 3a is formed in the center of the bottom plate 3f in view of strength. The ignitor holding portion 3 according to the embodiments of the 5 present invention is composed of an inner side cylindrical portion 3b standing on a wall thickness portion 3e of the bottom plate 3f of the ball-like lower lid 3 and holding the ignitor 30, a protruding portion 3d protruding into a center from the inner side cylindrical portion 3b and mounting the ignitor 30 over a packing 31, and a 10 bending portion 3c extending from the inner side cylindrical portion 3b, bending towards the center, and fixing the ignitor 30 by caulking.

Because the inner side cylindrical portion 3b is formed to stand on the wall thickness portion 3e of the bottom plate 3f as described above, the ignitor holding portion 3a is excellent in mechanical strength. Therefore, the ignitor holding portion 3a is not damaged by an internal pressure generated in combustion of the gas generating agent 6 even if the lower lid 3 is modified. Also, the ignitor holding portion 3a is integrally formed, there is no problem on sealing and a leak test is not required. It is not required to form the inner side cylindrical portion 3b over the wall thickness portion 3e. The side cylindrical portion 3b may be formed to stand on the bottom plate 3f directly.

The upper lid 2 and the lower lid 3 formed as described above forms a single cylindrical housing 4 abutting and joining side cylinders 1a and 1b with each other. Hence, a joining method is electron beam welding, laser welding, friction welding and the like.

Because the gas generator G1 of the present invention has a housing construction of a single cylinder, the side cylinder 1 should bear all force added in an axial direction against the internal pressure generated by combustion of the gas generating agent 6.

For a reason mentioned, it is preferable that a diameter (D) of the gas generator is no more than 70 mm. A length (L) in an altitudinal direction is preferable to be no more than 70 mm for a passenger seat and no more than 40 mm for a driver's seat to be incorporated in an airbag module (not shown).

A cooling/filtering member 7 is mounted throughout the upper lid 2 and the lower lid 3 in the housing 4 and a gas generating agent 6 is loaded being held by a cushion member 5 and a fixing lid member 9a therein. A ring member 9b having an L-shaped section is disposed abutting with a lower end of the cooling/filtering member 7 at the inside thereof. Both the fixing lid member 9a and the ring member 9b have a function of preventing a generated gas from flowing out from a gap between an inner surface of the housing and the cooling/filtering member 7. The gap appears by a modification of the housing 4 which occurs

when the gas generator G1 actuates. A cylindrical punched metal 11 having many holes on an outer periphery thereof is disposed on an outer periphery of the cooling/filtering member 7. The punched metal 11 has a function of preventing the cooling/filtering member 5 7 from being crushed by a gas pressure generated when a gas generating agent 6 burns and closing a space 12. The punched metal 11 reliably discharges a gas generated by combustion of the gas generating agent 6 through a gas discharge hole 8.

On inner surfaces of a large number of gas discharge holes 8 10 provided on the side cylinder 1a of the upper lid 2, a sealing member (e.g., an aluminum foil member) 10 is stuck and keeps inside of the housing 4 airtight with a packing 31 abutting on the ignitor holding portion 3a.

Next, an assembling process of the gas generator G1 shown 15 in FIG. 1 will be described based on the drawing. First, the packing 31 is abutted on the ignitor holding portion 3a of the lower lid 3 and the ignitor 30 is fixed by caulking. Then, the ring member 9b is put in and the cooling/filtering member 7 is inserted. And then, the gas generating agent 6 is loaded inside the 20 cooling/filtering member 7 and the fixing lid member 9a is disposed over the cushion member 5. The gas discharge hole 8 is covered with the upper lid 2 sealed by the sealing member 10 and the lower lid 3 and the upper lid 2 are joined. As a result, the gas generator

G1 shown in FIG. 1 is integrated.

Next, an operation of a gas generator of the present invention will be described taking the gas generator shown in FIG. 1 for instance. When a collision detecting device mounted in a vehicle detects a collision of the vehicle, the ignitor 30 ignites in response to a detection signal and the gas generating agent 6 is ignited by a flame of ignition. Then, a high-pressure gas starts to be generated by combustion of the gas generating agent 6. When gas pressure in the housing 4 rises and reaches a predetermined pressure, the sealing member 10 bursts and a high-pressure gas spouts out of the gas discharge holes 8 and instantaneously inflates an airbag (not shown).

A slag generated at the time of combustion of the gas generating agent 6 is collected and cooled in a process of passing through the cooling/filtering member 7 and supplied for the airbag. A temperature and a pressure in the housing 4 become instantaneously high after combustion starts. Housing structural members (the side cylinder 1, the upper lid 2 and the lower lid 3) made of iron or steel can be thinner in thickness than one made of an aluminum alloy. It is possible to make component members (the side cylinder 1, the upper lid 2 and the lower lid 3) to be thin by using iron or steel compared with using an aluminum alloy. It becomes easy to apply even an organic-compound gas generating

agent which is hard to be used for a housing made of an aluminum alloy. The kind of types of applicable gas generating agents can be increased and the gas generator can be readily designed.

In a gas generator, wherein a length (L) of a housing is
5 shorter than a diameter (D) thereof (a gas generator, wherein L/D is no more than 1), if the upper lid 2 and the lower lid 3 are thick, the gas generating agent cannot be loaded sufficiently. Therefore, increase of weight is required to be controlled. There is an upper limit to the thickness of the upper lid 2 and the lower lid 3 for a
10 reason mentioned above. A design, wherein the upper lid 2 and the lower lid 3 are not damaged but allowed to be modified, is desired. Particularly, the lower lid 3 requires to have an ignitor holding portion. In a case where the ignitor holding portion is fixed by welding or caulking as another member, it is hard to
15 prevent a damage of a fixing and joining portion accompanied with a modification thereof in a design in which the modification is allowed. However, the damage can be readily prevented because of integral forming. Even if L/D is no more than 1, a rigidity of the lower lid 3 improves and the modification of the gas generator can
20 be prevented.

The present embodiment, wherein the bottom plate 3f of the lower lid 3 and the top plate 2a of the upper lid 2 are in a ball-like shape, is described. However, the bottom plate 3f and the top

plate 2a may be flat.

As gas generating agents capable of being used in the present invention, gas generating agents, wherein nitrogen containing organic compounds such as tetrazoles compounds, 5 triazoles compounds, azodicarbonamides compounds, and guanidines compounds are used as fuel, and oxidizing agents such as nitrates, oxohalogenates are added thereto and mixed therewith, may be illustrated.

The gas generator according to the present invention is not 10 limited to the embodiment mentioned above. For example, it is possible to form the ignitor holding portion 3a eccentrically on the bottom plate 3f and form 2 and more ignitor holding portions.

Capability of Exploitation in industry

15 According to the gas generator for an airbag of the present invention described above, by making a lower lid of iron or steel and forming an ignitor holding portion integrally in a center thereof, it is possible to omit a joining and fixing process and a sealing process conventionally required for joining and fixing other 20 members. It is also possible to prevent a damage of a fixing and joining portion. As a result, an organic-compound gas generating agent, wherein an internal pressure is likely to be high at the time of burning thereof, can be readily applied.

Claims

1. A gas generator comprising a housing (4) formed by joining an iron- or steel-made upper lid (2), containing a top plate (2a) and a side cylinder (1a) extending downward from the entire circumferential edge thereof and provided with many gas discharge holes (8), with an iron- or steel-made lower lid (3) containing a bottom plate (3f), a side cylinder (1b) extending upward from the entire circumferential edge thereof, and an ignitor holding portion (3a) formed integrally with the bottom plate (3f) and for fixing by caulking an ignitor (30), the ignitor (30) and a gas generating agent (6) being arranged in the housing (4) in the order mentioned from the center thereof.
2. The gas generator according to claim 1, wherein a flange (1c) extends vertically outward from the side cylinder (1a) of the upper lid (2).
3. The gas generator according to claim 1, wherein the integral forming is done by a repetition of partial pressuring the iron or steel to flow.
- 20 4. The gas generator according to claim 3, wherein the lower lid (3) is formed into a ball-like shape.
5. The gas generator according to claim 3, wherein the ignitor holding portion (3a) stands on a wall thickness portion (3e) of the

bottom plate (3f) of the ball-like lower lid (3) and comprises an inner cylindrical portion (3b) for holding the ignitor (30), a protruding portion (3d) protruding from the inner cylindrical portion (3b) into a center thereof and mounting the ignitor (30), and
5 a bending portion (3c) extending from the inner cylindrical portion (3b), bending towards a center thereof, and fixing the ignitor (30) by caulking.

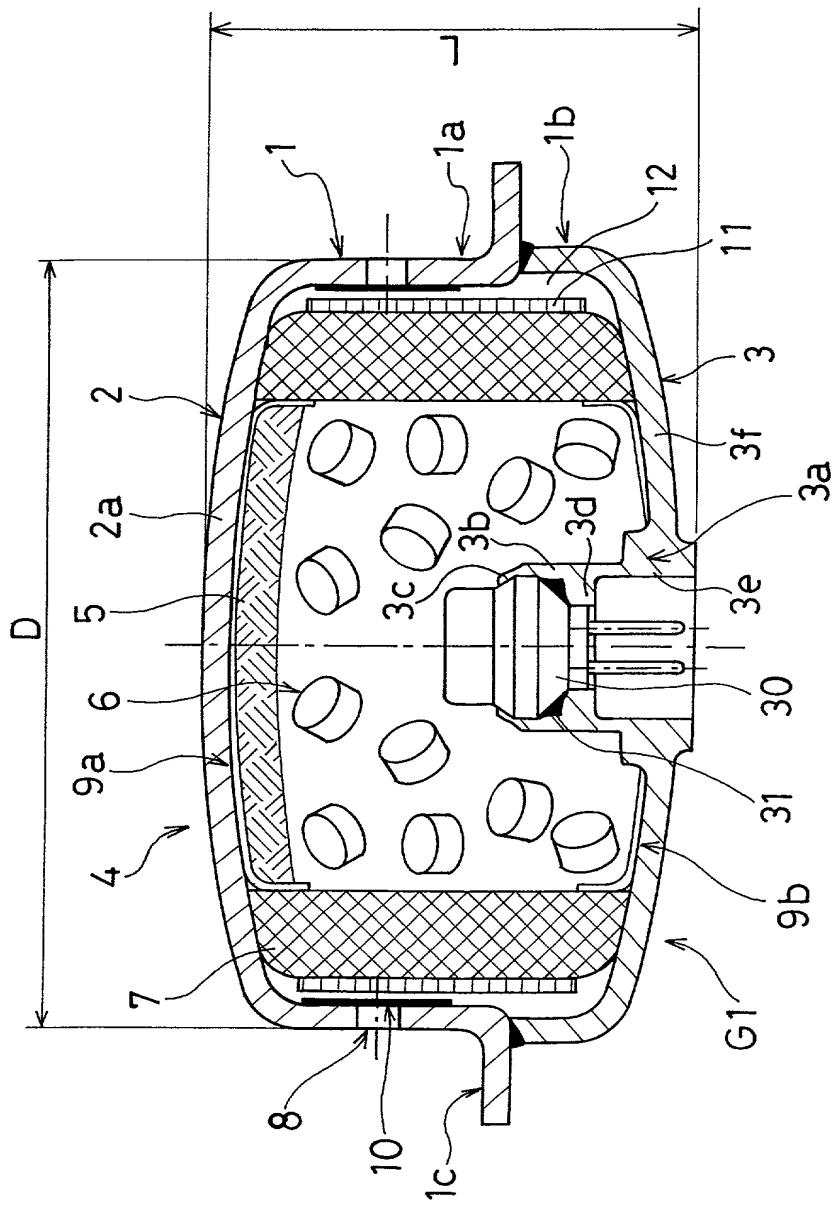
6. The gas generator according to claim 1, wherein a relation of an outside diameter (D) of the side cylinder (1) and a length (L)
10 from the upper lid (2) to an outer surface of the lower lid (3) is $L/D \leq 1$.

7. The gas generator according to claim 1, wherein the gas generating agent (6) is an organic-compound gas generating agent of which main component is a nitrogen containing organic
15 compound.

10/030939

OBLOON ET AL (703) 413-3000
DOCKET # 21795803 SHEET 1 OF 1

FIG. 1



Declaration and Power of Attorney For Patent Application

特許出願宣言書及び委任状

Japanese Language Declaration

日本語宣言書

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者（下記の名称が複数の場合）であると信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled.

GAS GENERATOR

上記発明の明細書は、

本書に添付されています。

月 日に提出され、米国出願番号または特許協力条約国際出願番号を _____ とし、
(該当する場合) _____ に訂正されました。

the specification of which

is attached hereto.

was filed on July 26, 2000

as United States Application Number or

PCT International Application Number

PCT/JP00/04980 and was amended on
_____ (if applicable).

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

Japanese Language Declaration

(日本語宣言書)

私は、米国法典第35編119条(a)–(d)項又は365条(b)項に基づき下記の、米国以外の国の少なくとも一ヵ国を指定している特許協力条約365(a)項に基づく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

Prior Foreign Application(s)

外国での先行出願

11-213351 (Number) (番号)	Japan (Country) (国名)

私は、第35編米国法典119条(e)項に基づいて下記の米国特許出願規定に記載された権利をここに主張いたします。

PCT/JP00/04980 (Application No.) (出願番号)	July 26, 2000 (Filing Date) (出願日)
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私は、下記の米国法典第35編120条に基づいて下記の米国特許出願に記載された権利、又は米国を指定している特許協力条約365条(c)に基づく権利をここに主張します。また、本出願の各請求範囲の内容が米国法典第35編112条第1項又は特許協力条約で規定された方法で先行する米国特許出願に開示されていない限り、その先行米国出願書提出日以降で本出願書の日本国内または特許協力条約国提出日までの期間中に入手された、連邦規則法典第37編1条56項で定義された特許資格の有無に関する重要な情報について開示義務があることを認識しています。

PCT/JP00/04980 (Application No.) (出願番号)	July 26, 2000 (Filing Date) (出願日)
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私は、私自身の知識に基づいて本宣言書中で私が行なう表明が真実であり、かつ私の入手した情報と私が信じるところに基づく表明が全て真実であると信じていること、さらに故意になされた虚偽の表明及びそれと同等の行為は米国法典第18編第1001条に基づき、罰金または拘禁、もしくはその両方に由処罰されること、そしてそのような故意による虚偽の声明を行なえば、出願した、又は既に許可された特許の有効性が失われることを認識し、よってここに上記のごとく宣誓を致します。

I hereby claim foreign priority under Title 35, United States code, Section 119(a)–(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Claimed		優先権主張
<input checked="" type="checkbox"/>	<input type="checkbox"/>	□
Yes	No	いいえ
はい	いいえ	□
<input type="checkbox"/>	<input checked="" type="checkbox"/>	□
Yes	No	いいえ
はい	いいえ	□
<input type="checkbox"/>	<input checked="" type="checkbox"/>	□
Yes	No	いいえ
はい	いいえ	□
<input type="checkbox"/>	<input checked="" type="checkbox"/>	□
Yes	No	いいえ
はい	いいえ	□

I hereby claim the benefit under Title 35, United States Code, Section 119 (e) of any United States provisional application(s) listed below.

PCT/JP00/04980 (Application No.) (出願番号)	July 26, 2000 (Filing Date) (出願日)
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I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of application.

Pending (Status: Patented, Pending, Abandoned) (現況: 特許許可済、係属中、放棄済)
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Pending (Status: Patented, Pending, Abandoned) (現況: 特許許可済、係属中、放棄済)
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Japanese Language Declaration

(日本語宣言書)

委任状：私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。

(弁護士、または代理人の指名及び登録番号を明記のこと)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number)



022850

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唯一または第一発明者名		Full name of sole or first inventor <u>Akihiko SUEHIRO</u>	
発明者の署名	日付	Inventor's signature <i>Akihiko Suehiro</i>	Date DEC. 20. 2001
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郵便の宛先	Post Office Address same as above		
第二共同発明者	Full name of second joint inventor, if any <u>Koiji TANAKA</u>		
第二共同発明者の署名	日付	Second Inventor's signature <i>Kojo Tanaka</i>	Date DEC. 20. 2001
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(第三以降の共同発明者についても、同様に記載し、署名すること)

(Supply similar information and signature for third and subsequent joint inventors.)

Page 3 of 4

Japanese Language Declaration 3-*er*

第三共同発明者	Full name of third joint inventor, if any <u>Takashi SASO</u>		
第三共同発明者の署名	日付	Third Inventor's signature <i>Takashi Sas</i>	Date DEC. 20. 2001
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第四共同発明者の署名	日付	Fourth Inventor's signature	Date
住所	Residence		
国籍	Citizenship		
郵便の宛先	Post Office Address		
第五共同発明者	Full name of fifth joint inventor, if any		
第五共同発明者の署名	日付	Fifth Inventor's signature	Date
住所	Residence		
国籍	Citizenship		
郵便の宛先	Post Office Address		
第六共同発明者	Full name of sixth joint inventor, if any		
第六共同発明者の署名	日付	Sixth Inventor's signature	Date
住所	Residence		
国籍	Citizenship		
郵便の宛先	Post Office Address		

(第七またはそれ以降の共同発明者に対しても同様な情報および署名を提供すること。)

(Supply similar information and signature for seventh and subsequent joint inventors.)